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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/512,074	07/05/2005	Giorgio Gandolfi	260599US6X PCT	2794

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OBLON, SPIVAK, MCCLELLAND MAIER & NEUSTADT, P.C.
1940 DUKE STREET
ALEXANDRIA, VA 22314

EXAMINER	
FLANIGAN, ALLEN J	
ART UNIT	**PAPER NUMBER**
3744	

NOTIFICATION DATE	DELIVERY MODE
10/20/2008	ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

patentdocket@oblon.com
oblonpat@oblon.com
jgardner@oblon.com

Office Action Summary	Application No.	Applicant(s)	
	10/512,074	GANDOLFI ET AL.	
	Examiner	Art Unit	
	Allen J. Flanigan	3744	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *25 July 2008*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *42-82* is/are pending in the application.

4a) Of the above claim(s) *62-82* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *42-55 and 57-59* is/are rejected.

7)☒ Claim(s) *56,60 and 61* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *11/2004*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

Applicant's election with traverse of invention I in the reply filed on 7/25/2008 is acknowledged. The traversal is on the ground(s) that the restriction requirement "does not set forth any reason why a person of ordinary skill in the art would combine [the teachings of] U.S. 4,071,083 with U.S 5,874,178". This is not found persuasive because the rejection which follows clearly sets forth the *prima facie* case for why the rejected claims of the elected invention are obvious, or lack an inventive step.

The requirement is still deemed proper and is therefore made FINAL.

Claims 62-82 are withdrawn from further consideration pursuant to 37 CFR 1.142(b), as being drawn to a nonelected invention, there being no allowable generic or linking claim. Applicant timely traversed the restriction (election) requirement in the reply filed on 7/25/2008.

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 42-49 are rejected under 35 U.S.C. 103(a) as being unpatentable over the combined teachings of Droin and Takayasu.

As indicated previously, Droin shows that it is known in the art to provide protective layers on tube sheets of tube in shell heat exchangers, specifically on the side facing the chamber connected to the tube interior (see

protective stainless layer 6 provided on ferritic supporting layer 5). Takayasu disclose a multilayer corrosion resistant plate structure, suitable for use as a tube sheet (Fig. 19 embodiment) comprising a carbon steel metal substrate 1, an intermediate stainless layer 3, and a corrosion resistant lining 4 of zirconium or titanium. Thus, it would have been obvious to one of ordinary skill in the art at the time the instant invention was made to employ the clad corrosion resistant sheet of Takayasu as a tube sheet in a heat exchanger of the tube in shell type as shown in Droin, particularly in view of the express suggestion found in Takayasu to do so, having the corrosion resistant layer 4 facing whatever chamber it was desired to flow the corrosive material through (such as the tube side manifold as shown in Droin).

Regarding claim 45, it would have been obvious to one of ordinary skill in the art at the time the instant invention was made to provide for corrosion protection covering any surface that would contact a potentially corrosive fluid, if such complete protection were desired.

Regarding claim 46, Takayasu recognizes the result effectiveness of controlling the thickness of the mesh layer 3 and the metal lining 4 (see lines 16-21 of column 11). Routine optimization of variables recognized to be result effective is considered obvious to those skilled in the art.

Regarding claim 47, although SUS304 is listed as the preferred material for the metal layer 3 of Takayasu, all of the materials listed in claim 47 are known corrosion resistant materials (Takayasu mentions both 304 and 316

stainless as possible materials for corrosion resistant metal plates), and it would have been obvious to one of ordinary skill in the art to employ any stainless steel alloy for metal Layer 3 of Takayasu.

Regarding claims 48 and 49, the limitations of these claims concern the intended method of making the claimed product. Such product by process limitations are given no weight where the prior art teaches a device that appears structurally identical to that produced by the claimed process. See MPEP 2113.

Claim 50 is rejected under 35 U.S.C. 103(a) as being unpatentable over the combined teachings of Droin and Takayasu as applied to claim 42 above, and further in view of Laber.

It is known in the art to provide leakage passages/weep holes in multilayer tube sheets as shown by Laber, and it would have been obvious to one of ordinary skill in the art at the time the instant invention was made to provide such a feature in any multiple layer tube sheet construction to permit the detection of leakage due to one of the layers being compromised.

Claims 51-55, and 57-59 are rejected under 35 U.S.C. 103(a) as being unpatentable over the combined teachings of Droin and Takayasu as applied to claim 42 above, and further in view of Menicatti et al.

As it is known to provide multilayered corrosion protection arrangements for tube sheets, so is it also known to do so for the tubes that carry corrosive fluids. Menicatti et al. teach a two layer tube construction featuring a stainless

steel tube layered on the inside with a thin foil of zirconium (see abstract). It would have been obvious to one of ordinary skill in the art at the time the instant invention was made to employ such layered tubes in the exchanger of Droin provided with the layered tube sheet taught in Takayasu to prevent corrosion failure of the tubes.

Regarding claims 52, 53, and 58, Menicatti et al. teach a thin liner of zirconium in the range of lower than 0.8 mm, preferably from 0.2-0.5 mm. No mention is made of preferred thicknesses for the stainless steel tube wall; it would have been obvious for one of ordinary skill in the art to make the tube wall thickness sufficient to provide ample structural rigidity without excessive thickness making the tubes unnecessarily heavy and resistant to heat flow across the tube wall.

Claims 56, 60, and 61 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

The remaining references show various layered designs for resisting corrosion in heat exchangers.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Allen J. Flanigan whose telephone number is (571) 272-4910. The examiner can normally be reached on M-F.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Cheryl Tyler can be reached on (571) 272-4834. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Allen J. Flanigan/
Primary Examiner, Art Unit 3744